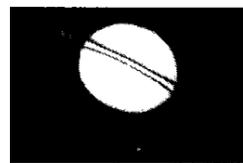


Kid cooperation

Elementary school students help train astronauts on Shuttle Amateur Radio Experiment. Story on Page 3.



Little explorer

Pioneer 11 ends operations after more than two decades of exploration. Story on Page 4.

Space News Roundup

Vol. 34

October 6, 1995

No. 40

Lacy Veach dies after long illness

By Eileen Hawley

Astronaut Charles Lacy Veach, 51, died Tuesday following a lengthy illness.

A memorial service is set for 4 p.m. today outside Hangar 990 at Ellington Field.

Veach was selected to be an astronaut with the class of 1984 and flew as a mission specialist on two shuttle flights—STS-39 and STS-52.



Veach

"Lacy Veach was an accomplished member of the NASA family," said NASA Administrator Daniel S. Goldin. "He was

a skilled pilot and an enthusiastic explorer. We will miss him."

On STS-39, an unclassified Department of Defense mission aboard *Discovery*, Veach participated in various experiments including working with an ultraviolet astronomical camera, an X-ray telescope, and a liquid helium-cooled infrared telescope which performed observations of the Earth's atmosphere and the Aurora Australis (Southern Lights).

During STS-52, Veach and the crew deployed the Laser Geodynamics Satellite. Veach also operated the shuttle's robot arm to test the Space Vision System designed to improve visual perception of crew members.

A private scholarship fund will be established in Veach's name. For information call Tamara West in the astronaut office at x48995.



JSC Photo by Mark Sowa

ATLANTIS DAY—City of Houston Mayor Bob Lanier, left, and City Councilman Joe Roach, right, accept a commemorative plaque in City Council Chambers from STS-71 Commander Robert "Hoot" Gibson, center. Gibson and his STS-71 crew received a proclamation, signed by Lanier, recognizing the astronauts and their "many significant accomplishments" of the mission. Local officials declared Sept. 26 "Space Shuttle *Atlantis* Day" in honor of their successful docking on June 29 with the Russian *Mir* Space Station.

Hurricane Opal threatens launch of *Columbia*

By James Hartsfield

With bad weather from the fringes of Hurricane Opal moving into the Kennedy Space Center area, shuttle managers Wednesday delayed the second STS-73 launch attempt of *Columbia* until today.

Today's launch window for the United States Microgravity Laboratory-2 mission opens at 8:40 a.m. CDT. The countdown toward a Thursday liftoff began at 3 a.m. Monday, but after watching strong winds and thunderstorms reduce the possibilities for safe loading of *Columbia's* external tank and take the possibility of getting off the ground Thursday to nearly zero, shuttle managers decided shortly before noon Wednesday to shoot for this morning. Opal's effects were expected to clear the launch area rapidly. On Friday, the possibility of winds coming from the wrong direction is about the only weather concern.

A faulty fuel valve in *Columbia's* Main Engine No. 1 that halted the first launch countdown with about five and a half hours to go Sept. 28 was removed and replaced during the weekend.

KSC technicians removed the faulty valve on Saturday and sent it to Rocketdyne in Canoga Park, Calif., for failure analysis testing. The new valve was installed later

that same night and tested on Sunday.

The crew, split into two teams for STS-73 to allow around-the-clock operations, traveled back to Houston during the delay, but returned to KSC on Monday. The Red Team—Commander Ken Bowersox, Pilot Kent Rominger, Payload Commander Kathy Thornton and Payload Specialist Albert Sacco—arrived back at the launch site at about 3 p.m. The Blue Team—Mission Specialist Cady Coleman and Mike Lopez-Alegria and Payload Specialist Fred Leslie—followed, arriving at about 9:45 p.m.



With an on-time launch Friday, *Columbia* would land at 6:35 a.m. CDT Oct. 22. The Saturday launch window opens at 8:41 a.m. CDT.

Operations by the two teams of crew members during STS-73 will keep the same schedule as had been the case for a launch last week, with the Red Team approximating a day shift in Houston and the Blue Team working overnight. Servicing of the experiments aboard *Columbia* and the United States Microgravity Laboratory-2 began Saturday and were completed on Tuesday.

Elsewhere, *Atlantis* is on track for a launch as early as Nov. 1 on STS-74, the second mission to

Please see **ATLANTIS**, Page 4

'Meatball' official logo

The 'meatball' is now the official logo of NASA.

After a lengthy transition period, the NASA insignia has officially replaced the NASA logo as the standard agency identification symbol.

Effective immediately, the NASA Insignia should be used on all publications, forms, posters, patches, signage, exhibits, awards and in



other situations in which agency identification is necessary.

Any questions concerning graphics requirements or standards, should be referred to Peggy Wooten at x30700.

NASA issues benchmarking policy to help employees

To ensure that employees develop a common understanding of benchmarking and its benefits, the agency recently formalized a NASA Benchmarking Policy and JSC's benchmarking focal point is available to answer questions concerning this policy.

The policy was based on an approach developed and used by the International Benchmarking Clearinghouse as well as input from and coordination with the Continual

Improvement Focal Points at each center.

The terms "benchmark" and "benchmarking" have been used throughout NASA to describe various activities. A recent agency-wide survey revealed that the level of process formality and results varied greatly.

The survey revealed that some teams informally contacted other organizations or companies to see how a particular process was performed while other teams followed a very

structured benchmarking methodology similar to that often used in private industry.

Today's environment requires NASA to work faster, better and cheaper while meeting the increasing demands of its many customers. Effective use of benchmarking and other tools can help NASA keep pace.

Benchmarking can be used to re-design processes and products, accelerate and manage change and produce breakthrough innova-

tions. A benchmarking study requires a structured approach, total understanding of the process being benchmarked and commitment of time and resources.

JSC's Continual Improvement Focal Point Ed Pritchard suggests that before committing time and resources to a study, first determine whether benchmarking is the appropriate tool. Pritchard is available to answer questions and can be reached at x34212.

Don't throw it away

By Barbara Tomaro

At JSC, recycling is nothing new. From paper to recovered space vehicles, used items are evaluated, modified and reused over and over. When their functions for the space program are finally over, used items can end up in some interesting places.

To ensure the safety of a crew and the integrity of equipment in space, millions of tests are run on equipment to simulate the actual materials, environments and scenarios. Test equipment is built and modified using new and existing resources to check out future items for space worthiness. The same test beds may be used from one program to the next, or one evaluation to the next over years, and can be altered so much that it is hardly recognizable. If it is not destroyed during testing, and no longer of use, it may be loaned to museums or

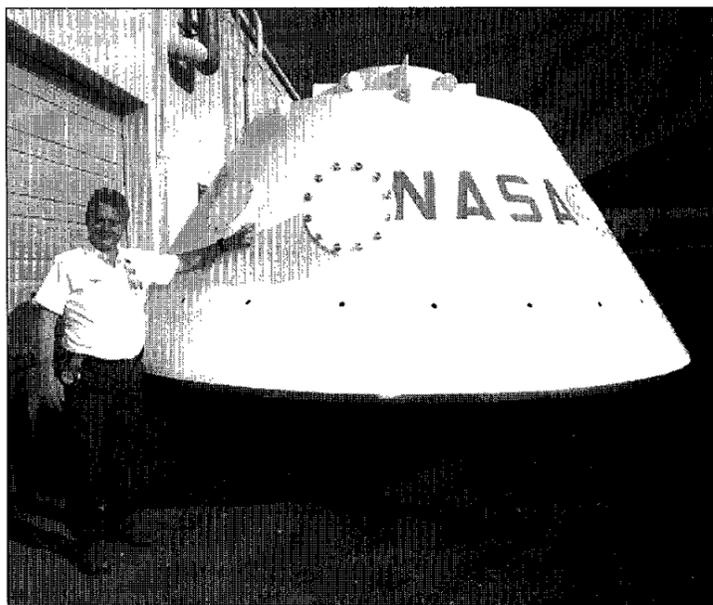
other institutions who display it as part of our nation's space history.

When Deborah Nowlin, an Astrodome representative, called seeking equipment or artifacts to display representing their tie with the Space City community, the used equipment inventory list was searched for possible candidates. At first, nothing showed up that Louis Parker, JSC exhibits manager, thought would be appropriate.

"They were looking for an Apollo command module, but all of those actual modules are already out on permanent loan," Parker said.

Employees of the exhibits shop, however, thought they had seen a modified boiler plate on-site at JSC. When Louis checked, he discovered boiler plate BP-K, a replica of an Apollo Command Module made of boiler plate metal. Only vaguely recognizable as the original com-

Please see **APOLLO**, Page 4



JSC Photo by Mark Sowa

Roger Eklund of Hernandez Engineering displays the refurbished Apollo command module that will soon become part of a museum display at the Astrodome.

Spartan 201 achieves goal

NASA scientists reported last week that Spartan 201 successfully completed its mission on STS-69.

Project Scientist Dick Fisher, at Goddard Space Flight Center, reported that the tapes retrieved from the Spartan 201 indicated that the free-flying spacecraft appears to have done its job properly and both instruments worked as planned through virtually all of the mission.

Concern about whether the Spartan had operated correctly was raised when the spacecraft was to be retrieved during the STS-69 mission on Sept. 10. At that time, the crew reported that Spartan was rotating slowly, and its batteries seemed to have been drained. Until the spacecraft could be examined following landing, it was not possible to know whether it had accomplished its mission of observing the Sun's northern polar regions.

Please see **SCIENTISTS**, Page 4

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Texas Renaissance Festival: Sept. 30-Nov. 12. Tickets cost \$10.50 for adults and \$5.25 for children 5-12.

Texas Renaissance Festival Bus Trip: Oct. 14 and Nov. 11. Tickets cost \$17 for adults and \$12 for children 5-12.

Deep Sea Fishing: Nov. 5. Fishing tickets cost \$40 for adult and \$20 for children. Ride tickets cost \$20 for adults and children under 12 free.

Isle of Capri Casino Trip: Oct. 15. Tickets cost \$5.

Bay Area Chorus Fall Concert: 8 p.m. Oct. 21 at Clear Lake Presbyterian Church. Tickets cost \$8 for adults and \$5 for students and seniors.

Halloween Dance: Oct. 28. Tickets cost \$15 per person.

Wurstfest: Nov. 4. Tickets cost \$17 for adults and \$12 for children 12 and under.

University of Houston vs. Baylor football: Oct. 14, Astrodome, \$8.

University of Houston vs. University of Texas football: Nov. 11, Astrodome, \$15.50.

Houston Aeros Hockey: Houston Aeros vs. Atlanta Knights at 7 p.m. Nov. 17 in the Summit. Tickets cost \$12.50.

Sea World: Tickets cost \$23.50 for adults and \$16.25 for children 3-11.

Splashtown: Tickets cost \$11.05.

Space Center Houston: Discount tickets, adult, \$8.75; child (3-11), \$7.10.

Metro tickets: Passes, books and single tickets available.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4; Sony Loew's Theater, \$4.75.

Stamps: Book of 20, \$6.40.

JSC history: *Suddenly, Tomorrow Came: A History of the Johnson Space Center.* Cost is \$11.

Upcoming events: Wings Over Houston Air Show Oct. 21-22.

JSC

Gilruth Center News

Sign up policy: All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

EAA badges: Dependents and spouses may apply for photo identification badges from 7 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Women's self defense: Martial Arts training for women only from 5-6 p.m. Tuesdays and Wednesdays. Cost is \$25 a month.

Weight safety: Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Oct. 10 and Oct. 26. Pre-registration is required. Cost is \$5.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays.

Aikido: Martial arts class meets from 5-7 p.m. Wednesdays. Cost is \$25 per month. New classes begin the first of each month.

Ballroom dancing: Cost is \$60 per couple. For additional information call the Gilruth Center at x33345.

Country and Western dancing: Beginner class meets 7-8:30 p.m. Monday. Advance class meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Fitness program: Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site-contractor employees. Each ad must be submitted on a separate full sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP2, or deliver them to the deposit box outside Rm. 181 in Bldg 2. No phone or fax ads accepted.

Property

Sale: Clear Lake Forest, 4-2-5-2, glass walled den family room, FPL, w/hi ceiling, formals, new roof & paint/carpet/paper. 326-2307.

Sale/Trade: League City, Ellis Landing, 4-2-2, w/2 story Dutch barn, 12x16, will take your house or condo in trade, \$89.9k. x41929 or 332-3775.

Sale: Pasadena, 3-2-2 brick, DPISD, landscaped, FPL, sec alarm, Jacuzzi, ceiling fans & miniblinds, lg yard, assume loan. x36324 or 477-1478.

Sale: University Green Patio home, 2-2-2D, lg covered deck, Jenair, greenhouse, \$5k equity & assume note \$87k. 286-0964.

Lease/Sale: Clear Lake condo, 1-1, study, carport, gate, alarm, very nice, \$560/mo. 286-9478.

Sale: Clear Lake, 2-1-5, 1250 sq ft, \$45k. 282-2714.

Rent: SageGlen, 4-2-2, formal living/dining, den w/CF, FPL, CCISD, no pets, \$850/mo. 282-3229 or 286-4547.

Sale: Taylor Lake Estates wooded lot 90' x 135', can finance, \$39.5k obo. Don, x38039 or 333-1751.

Sale: LaMarque, 4-1-1.5, 1950 sq ft, window A/C, CF, mini blinds, fenced yd, \$56k. 409-938-4793.

Lease: Webster condo, lg/clean & upstairs, 2-1, W/D conn, appli, FPL, ceiling fans, avail mid Oct, \$520/mo. 486-0315.

Rent: Landings in Seabrook, condo, 2-1. 282-3731 or 532-1967.

Rent: Winter Park, Co, 2-2, sleeps 6, furnished, hot tub, heated pool, Spring Break still avail. 488-4453.

Rent: Lake Travis cabin, private boat dock, central air & heat, fully equipped, sleeps 8, full \$550/wkly & \$120/dly. 474-4922.

Rent: South Lake Tahoe cabin, 2-2, kitchen, W/D, cable TV/VCR, sleeps 8, \$75/night except holidays. x41065 or 326-2866.

Rent: Beach house, Crystal Beach, Galveston Co, furnished, sleeps 10, wknd/wkly rates. x32805 or 409-684-4419.

Cars & Trucks

'64.5 Mustang, red, 289, looks & runs good, \$3k obo. 486-0972.

'88 Dodge Aries wagon, 2.2L, 5 speed, TBI, PS/PB, rear wiper & defrost, cruise, new clutch, A/C, evap, & waterpump, 7.9k mi, \$3k obo. Lane, 280-0437.

'79 Mercedes 280 SEL, 4 dr, silver/gray, sun roof, power, no air, looks & runs great, 182k mi, \$3k obo. 992-5862.

'88 Nissan Pathfinder, blue, 4WD, V6, 5 spd, 55k mi, cruise, AM/FM/cass, 1 owner, great cond, \$10.2k. x36621 or 488-5533.

'86 Jeep Cherokee Laredo, 5 spd, 4WD, 4 cyl, A/C, 100k mi, AM/FM/cass, white/tan, 1 owner, \$5.4k. x48541 or 538-3444.

'84 Mazda RX-7 GSL-SE, black/red, 5 spd, sunroof, AM/FM/cass, good cond, \$2,950. 582-0415.

'94 GMC Sonoma SLS, 4.31, 4 cyl, 5 spd, tint, CD, bed liner, 15k mi, \$11.5k. 286-2361.

'88 Ford Tempo, Silver, 2 dr, auto, A/C, P/L, cruise, tilt, cass, clean, \$1.6k. 282-3172 or 332-6588.

'89 Mazda CabPlus truck, B2200 series, red w/charcoal int, auto, A/C, AM/FM/cass, bed liner, new battery/tires, \$5.8k. 482-8820.

'84 Honda Accord, P/S, cruise, 4 spd, 3 dr, 98k mi, \$1.7k. 282-6909 or 476-5817.

'95 Ford F-150 ext cab truck, customized leather int, CD, radar detector, alarm, bed cover, 6.5k mi, \$3.4k. x31833 or 360-0727.

'93 Nissan Sentra, 4 dr, auto w/O/D, A/C, AM/FM/cass, P/S, P/B, 53k mi, \$8.3k. Bob, 480-5322.

'82 Toyota Corolla Station Wagon, manual, burgundy, bucket seats, \$750. 333-3789.

'84 Suburban Chevrolet, auto, diesel 6.2 L, panel rear dr, blue/grey, \$1.2k. 333-3789.

'82 Cadillac Sedan DeVille, white, ex cond. \$3.5k. Steve, x36725.

'88 Jeep Wrangler, 83k mi, 6 cyl, 5 speed, A/C, new soft top, ex cond, \$7.5k. 334-7143.

'66 Mustang, 289, 4 speed, dual exhaust, good cond, \$3.5k. 331-9255.

'79 Buick LaSabre, good work car, \$800. 482-5621.

'87 Nissan 200-SX HE hatchback, red, ex cond, auto, pwr, cruise, sunroof, A/C, AM/FM/cass, spoiler, 98k mi, orig owner, \$4.2k. 282-3229.

'84 Ford F-150, PU, A/C, 4 speed, 6 cyl, new parts, 108k mi, good cond, \$3.5k obo. Les, x30090 or 331-4589.

'91 Chevy S10, std, 5 spd, 4 cyl, A/C, AM/FM/cass, 47k mi, \$5.8k. x37149 or 409-925-2291.

'81 Mercedes 380 SL, silver, 43k mi, ex cond, \$9k. 333-3672.

Amigo cart, rear wheel drive, on-board charger, new batteries, \$850. Tom, x47473 or 332-1530.

Cycles

'87 Honda Magna 700cc, low mi, ex cond, \$3k. 488-6526.

Boats & Planes

'89 Sea Ray, 20' bowrider 192 hr, ex cond, used in fresh water, \$8.2k. 326-2361.

Audiovisual & Computers

Toshiba T1000LE Laptop w/carry case, 20 Mb, XT class, \$350 obo. Steve, 282-2714.

Pioneer compact disc player #PD-4550-8FS, full function remote, single tray, \$80 obo. Lisa, x40213

JSC

Dates & Data

Today

Entries due: JSC is sponsoring a poster contest in recognition of Fire Prevention Week, October 8-14. The contest is open to children of civil service and contractor personnel. All posters must be turned in by close of business Oct. 6 in Bldg. 110. For more information, contact Rindy Carmichael at x45078.

Cafeteria menu — Special: baked meatloaf. Total Health: baked potato. Entrees: chicken fajitas, ham steak, pork and beef eggrolls, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: stewed tomatoes, seasoned spinach, cut corn, macaroni and cheese.

Monday

Columbus Day: Most JSC offices will be closed in observance of the Columbus Day holiday.

Tuesday

Photo club meets: The Bay Area Photo Club will meet at 7:30 p.m. Oct. 10 at Faith Covenant Church. For more information call Kelly Prendergast at x37655.

Cafeteria menu — Special: stuffed cabbage rolls. Total Health: roasted turkey. Entrees: turkey and dressing, country style steak and hash browns, beef ravioli, baked chicken, fried cod fish. Soup: tomato Florentine. Vegetables: Italian blend, okra and tomatoes, corn cobbette, navy beans.

Wednesday

Toastmasters meet: The Space-land Toastmasters will meet at 7 a.m. Oct. 11 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. Oct. 11 in the executive dining room in the Bldg. 3 cafeteria. For more information call Michael Ruiz at x38169.

SSFF meets: The Space Station Future Fighters will meet at noon

Oct. 11 at the Freeman Memorial Library at 16602 Diana. For information call David Cochran at 335-0185.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon Oct. 11 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call **Al Jackson at 333-7679.**

Cycle club: The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. Oct. 11 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

Cafeteria menu — Special: pepper steak. Total Health: stir fry pork with rice. Entrees: liver and onions, stir-fry pork with rice, steamed fish, western special, Reuben sandwich. Vegetables: steamed broccoli, yellow squash, macaroni and cheese, vegetable sticks.

Thursday

Airplane club meets: The MSC Radio Control Airplane Club will meet at 7:30 p.m. Oct. 12 at the Clear Lake Park Community Bldg. For more information call Bill Langdoc at x35970.

SSQ meets: The Society for Software Quality will meet at 5:30 p.m. Oct. 12 at the Ramada Kings Inn on NASA Road 1. Anthony Lekkos of ProtoSoft will discuss "Requirements for Zero Defects in Commercial Software." Advanced tickets cost \$10 for members and \$14 for nonmembers. For more information call Dot Royer at 335-5888.

Cafeteria menu — Special: chicken fried steak. Total Health: baked potato. Entrees: beef tacos, steamed pollock, baked chicken, catfish special. Soup: navy bean. Vegetables: spinach, cut corn, breaded okra, pinto beans.

Friday

Cafeteria menu — Special: tuna noodle casserole. Total Health: baked potato. Entrees: steamed salmon steak, baked chicken, fried cod fish, ham steak. Soup: seafood

gumbo. Vegetables: French cut green beans, cauliflower with cheese, green peas, black-eyed peas.

Oct. 17

NTA meets: The National Technical Association will meet at 6:30 p.m. Oct. 17 at Texas Southern University School of Technology Rm. 316. For more information call Carrington Stewart at x31404.

Oct. 18

Toastmasters meet: The Space-land Toastmasters will meet at 7 a.m. Oct. 18 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon Oct. 18 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at 333-7679.

Cycle club: The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. Oct. 18 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

Oct. 20

NMA meets: The Texas Gulf Coast Council of the National Management Association, will sponsor a joint chapter meeting at 5:30 p.m. Oct. 20 at the South Shore Harbour Resort and Conference Center. Local NMA chapters including the Bay Area Community chapter, Hernandez Engineering, HTI-Link, Johnson Controls, Krug Life Sciences, Lockheed Martin, Loral Space Information Systems, JSC, Rockwell, Grumman, Unisys and the U. S. Postal Service will gather for the presentation of the prestigious Gold Knight of Management Award. Bryan Townsend will discuss "Life is an Adventure." Tickets cost \$25 per person, and reservations must be made by Oct. 11. For more information, call Kyle Brantley at 212-1375, or Rhea Ann Saylor at x32412.

Miscellaneous

Sears rowing machine, \$50; Spirit Stair climber, \$300. 328-3840.

Sy Quest 44Mb SCSI drive, \$150; twin size mattress set, \$50; 44Mb cartridges, \$25 ea; Fisher Price car seat, \$30. 480-3424.

Novatel Cell phone, \$50; 19" color TV w/remote, \$115; Korg 8 channel mixer, \$45; AKAI AX-60 keyboard w/stand, \$275. P. Quinn, x38575.

Mountain bike, 10 spd, ex cond, \$75 firm. x41096 or 326-5184.

U.S. Divers backpack, \$40; Dacor Vista-Vu mask, \$10. Tacy, 480-5690.

Green house approximately 10' x 12'; you dismantle & haul, \$159. 286-1934.

M-77, 338 Win Mag, new scope rings, 2 boxes ammo, \$460; gun case, \$7; Winchester 12 g low base shells, \$3.50/box. Charles, x37678 or 661-4189.

Joelle designer wedding dress, short train, whitened, sz 8, veil & krenelin included, new \$1.2k, sell \$600; women's roller blades, sz 8, \$25; black leather car mark for Honda CRS, new, \$50; beige mini blinds, \$4/ea; wedding cake top, \$15; desk lamp, \$5; leather briefcase, \$75. Su, x45722.

Goodyear Wrangler RT/S LT245/75R16 tires, 5 lug 16" chrome wheels, off '95 Dodge truck, tires list for \$127 ea & wheels \$225 ea, \$475/all. 482-5524.

Browning A-Bolt 7mm Mag w/Leupold 3x9 30mm objective scope, matte finish w/synthetic stock, gun case w/sling, \$600 obo. Ken, 996-0618.

'94 Cannondale M300 mountain bike, 22" aluminum frame, Shimano components, Brahma handlebars, Blackburn seat pouch, gel seat, new \$600 sell \$465. Jenny, x38300 or 992-7004.

Oak/wrought iron dining room table & 6 cushioned wrought iron chairs, \$700; oak hutch w/beveled glass doors, \$500; king size water bed, \$100. x48417 or 286-4176.

Court's barrel saddle, 14" seat, ideal for youth, good cond, \$225. 554-5261.

Wedding dress, white, size 3/5, S/S, w/veil & petticoat, new \$550, sell \$200. 882-0405 or 480-0422.

Set of McGregor Irons, cord grips, \$75; bag trolley, \$15. x37906 or 286-9455.

Japanese Koi, small sizes to 10", \$2.50 up. 997-2835.

Refrigerator, side-by-side, 20 cu ft, ex cond, \$250; lawnmower, 20" cut, rear bagger, \$25; diamond engagement ring, 1/3 plus carats, new \$600 sell \$300. Bob, 480-5322.

Enviraicare 13500 professional iar cleaner w/HEPA filter, \$50; white, Westinghouse roll-around dehumidifier, \$65; Remington .270 deer rifle, \$450. John, x38818.

Dog bed, \$5; stop barking trainer, \$10; Atari player + games, \$10; antique cabinet stereo w/turntable, \$30; 8 seat spa w/everything, \$2.9k. x35092 or 944-2391.

\$75 per set. x41065 or 326-2866.

GE Super capacity gas dryer, 5 cycles, ex cond, almond color, \$100. Tracy, x47453 or 480-5690.

Girls hutch top desk set, French Provincial cream w/blue trim, \$300; petite high boy dresser, 5 drwr, Queen Anne cream, \$150; white wicker child armchair & oval table, \$25 ea. 474-9747.

Lalique angel goblets, 8; '87 Waterford xmas ornament, best offer. 480-1024.

Curtis Mathis color TV, 25", ex cond, \$200. 282-6909 or 476-5817.

Contemporary sofa/wing back rocker chair w/loose pillows, blk lacquer trimmed, \$350; 2 tables, \$50; blk lacquer wood entertainment center, ex cond, \$150. 997-9722.

Maytag washer & gas dryer, ex cond, \$690. x32686.

King size Ponderosa pine waterbed, headboard w/mirrors, lights & drawers, high profile pedestal, free flow matt & heater, ex cond, \$550 obo. Brian, 333-6059.

King size waterbed, sheets, pillow cases, ex cond, \$100; kitchen table, \$50; hi back, nap-long couch, grey, ex cond, \$100. 409-938-4793.

W/D, ex cond, all cycles, \$150 ea. 409-744-0975.

Tappan microwave, \$35; kitchen table & 6 chairs, beige/chrome, \$50. Laura, x31303 or 326-1573.

Kenmore gas dryer, white, works well, \$75 obo. 997-6141.

Wanted

Want personnel to join VPSI vanpool departing Meyerland Park & Ride at 7:05 a.m. for JSC. Van pool consist of on-site personnel working 8 am/4:30 pm shift. Don Pipkins, x35346.

Want personnel to join van pool departing Southwest Park & Ride lot at 6:50 a.m. for JSC & offsite locations, 7:30 a.m. - 4:30 p.m. shift. Susan Gaynor, 282-5447 or Ed Rangel, x36124.

Want MacIntosh computer, must be in good working condition, \$400 or less. 326-2307.

Want low priced Toyota, Nissan or Mazda pickup; school/work car or truck. 271-7011.

Want someone for available motorhome for one-way trip pick-up in Anchorage, Alaska, drive to Texas. Jeff Bennett, 333-7062.

Want boy's 16" - 20" bicycle; small doll house w/furniture, reasonable. 480-3424.

Want Christmas donations for needy families w/infants, any toys & clothes for new born & up. Bea, x31094 or 948-0282.

Want ultimate frisbee players, no experience necessary, will teach, every Mon & Wed, Clear Lake Park, 7:30 - 9 p.m. Dan, 282-5239 or 486-1102.

Want donations for Son Light Mission on 518 in Friendswood, needed are a washer & electric dryer; a electric stove, and other household items. Julia, 331-3304.

or 554-4140.

Kid Cooperation

By Norma Rhoads

Question: What is one thing the STS-74 crew and school children have in common? Answer: SAREX.

Next month, the Shuttle Amateur Radio Experiment or SAREX will fly for the 19th time as a payload on board STS-74. To prepare the astronauts for the mission, local students have pitched in to help with training exercises.

"SAREX flies only four or five times a year," said Matthew Bordelon, who took over as SAREX principle investigator in March. "Since there are so many schools that want to participate in the SAREX program, but only a few flight opportunities to go around, having the students participate in the pre-flight training gives both sides many educational benefits."

Before Bordelon accepted his new role, he was involved in training crews for the experiment. His experience in training the astronauts for SAREX led him to initiate practice sessions with local schools during integrated simulations. With the help of the Education Working Group and some local amateur radio clubs like the Clear Lake Amateur Radio Club and the JSC Amateur Radio Club, the school simulations began.

"In reviewing the SAREX training, what to expect when talking to school children was found to be lacking in the astronauts' simulations," said Bordelon. "By the same token, what a school should expect when talking to an astronaut in space was also undocumented. There is always a waiting list of schools wanting to participate in SAREX during a flight. And, once a school has participated in the onboard SAREX program, it cannot do so again. However, schools still may practice and learn more about amateur radio by working with astronauts as they train for flights that will carry SAREX."

Several local area public and private schools, as well as schools outside the state of Texas, have participated in the SAREX simulations. Armand Bayou Elementary, Bales Intermediate, Winfield Elementary in Winfield, Kan., Armand Bayou Montessori and Gardens Elementary are just a few. Any school can volunteer to participate, and it helps if they have an amateur radio club in their school.

One such school, Gardens Elementary, has a teacher that is an amateur radio operator. Arlene Kovak is a fourth grade science teacher at Gardens Elementary in Pasadena. She inspires her students to work hard to achieve all they can. Anyone entering Kovak's room instantly knows she uses the U.S. space program to motivate her students. Every wall is filled with information on the space program: Kovak's participation in Partners in Space, SAREX, and amateur radio posters and newspaper articles concerning her students participation with the space program.

Kovak found out about SAREX after being introduced to amateur radio by her friends. She said she has found SAREX to be a wonderful instrument to build self-confidence and self-esteem within her students and spark their interests in science, math and technology.

"The student, and their parents, think this is just wonderful," she said. "They ask questions of the astronauts and they get answers that are highly technical. The students know that these are very educated people that are talking to them. This experience provides such a high standard for a role model."

Kovak said she has had a lot of help along the way. The Quarter Century Wireless Association has been heavily involved with the children. QCWA members and other radio operators visit Kovak's classes to assist the students, help find inexpensive, good equipment and set up or fix whatever is needed. These volunteers, known as ELMERS, spend their own time and some of their own money to promote education. Many of these ELMERS are either retired or current JSC civil servants or contractor employees.

Kovak noted that having role models such as the astronauts and all of the people who have helped the students is one of the benefits of this program. The students are able to

learn all about the education needed for different types of professions.

"What I hope all this leads to," Kovak said, "is that the students' interest in the space program and their interest in life will be channeled into something very positive. Then their education will continue through high school and then through college."

Gardens Elementary, and Kovak's classes in particular, holds the astronauts contacted via SAREX in high regard. After contacting STS-58 Mission Specialist Bill McArthur during his mission in November 1993, McArthur personally delivered QSL or "contact" cards to the students.

"Everyone was just enthralled with him," Kovak said. "He was so wonderful with the children."

Kovak's classes recently contacted McArthur again while talking over their classroom radio with STS-74 crew members during simulations last week. In addition to McArthur, the students had the opportunity to talk with several other astronauts, including Bob Cabana and Kevin Chilton. Kovak conducts ongoing activities and students work with the amateur radio on a weekly basis, interfacing with active and retired JSC employees and contractors.

Prior to each SAREX mission, Kovak has her students working lesson plans and researching the mission and backgrounds of the astronauts. Several local area public and private schools, as well as schools outside the state of Texas, have participated in the SAREX simulations.

The educational objectives of the SAREX payload are to encourage students to pursue careers in science and mathematics and stress the importance of education and to show students that there is a connection between education and real life activities. But SAREX provides a meaningful recreational activity for shuttle crew members while accomplishing these goals and others including conducting scientific experiments and promoting international goodwill and cooperation.

The SAREX program has made contact with thousands of students and amateur radio operators all over the world. During the last twelve years, SAREX has flown on all five orbiters; and over 45 astronauts have become amateur radio operators. Between 30 and 40 school contacts are made each year. During free time and when not talking to school children, the astronauts communicate with other amateur radio enthusiasts throughout the world.

And SAREX activities do not stop there. Having SAREX onboard the International Space Station would allow more of the general public and more schools to participate. To get ready for the International Space Station, SAREX will attempt to expand its activities to the Russian MIR Space Station during STS-76 scheduled for March 1996.

"In fact, three of the five missions on which SAREX is scheduled to fly next year will be shuttle-MIR docking mission—STS-76, STS-79 and STS-81," said Bordelon.

To expand the program, a request was made by the SAREX Working Group that would allow the astronauts to make SAREX contacts (school groups, general and personal contacts) using the MIR radio. While there is much work to be done in order to make this feasible, it could provide a unique opportunity to validate some of the new operations techniques that are needed to put into practice on the station. According to the SAREX Working Group, SAREX as a permanent part of the space station would serve as an educational tool, be an outreach to the general public, allow a way for crews to maintain contact with family and friends while on orbit, (thus improving psychological factors), provide an experimental communications testbed, offer a backup communications link for emergencies, and provide public information to the grassroots public.

The placing of SAREX on STS-9 in the early 1980's was initiated by former employee Owen Garriott and Roy Neal of NBC News through Shuttle Program Manager Gen. James Abrahamson. The program was implemented by Doug Ward and Chuck Biggs of the Office of Public Affairs; Dick Fenner of E&D Communications; former JSC employee Lou McFaddin and a host of others. □



Photos by Andrew Patnesky and Arlene Kovak

From top to bottom: A fourth grade student talks with STS-74 astronauts on SAREX. Astronaut Bill McArthur, right, takes a break after a SAREX practice session. Students take turns operating the amateur radio. Science teacher Arlene Kovak watches over students as they help train the STS-74 astronauts on the SAREX.

SAREX is requested on almost every flight, but only flies on about four missions a year due to budgetary constraints. While SAREX is sponsored by Code F at Headquarters, the Amateur Satellite Corporation, and the American Radio Relay League; experiment operations are conducted solely by voluntary support.

Earth observing contract highlights NASA's new business practices

After extensive discussions aimed at getting the best deal for U.S. taxpayers, NASA has awarded a \$398.7 million contract to TRW Inc., Redondo Beach, Calif., for the Earth Observing System Common Spacecraft.

"I'm very pleased with this contract," said NASA Administrator Daniel S. Goldin. "It represents the new way of doing business—getting the absolute most for the dollar. We asked bidders to be innovative in technical design and management and realistic in estimating costs. We've made NASA a better buyer and we're getting the most for taxpayers."

In May, NASA informed all offerors that their prices were unrealistic for the proposed technical approach. After NASA and each individual firm discussed technical and cost-realism issues, each firm in the competitive range submitted a "best and final offer." Those offers were the basis for the selection.

The contract is for two spacecraft, EOS PM-1 and EOS CHEM-1, with separate options for two additional spacecraft. If both options are exercised, the contract's value will increase to \$668.5 million. The contract became effective on Sept. 15 and with the exercise of both

options would continue through 2012.

TRW will design, fabricate, integrate, test, deliver and provide launch support and flight operations support. The spacecraft launches begin in 2000 (PM-1). Goddard Space Flight Center will manage the contract.

The EOS Common Spacecraft will serve as the platform for obtaining some of the 24 measurements that comprise the heart of the EOS mission. The EOS PM-1 spacecraft will focus on climate-related measurements of the Earth's atmosphere, cloud cover, precipitation, terrestrial snow cover and sea ice. EOS

CHEM-1 will measure a variety of chemicals in the Earth's atmosphere.

EOS is the centerpiece of NASA's Mission to Planet Earth, a long-term coordinated program to study the Earth as a single, global environment. MTPE data are already being used to study the connections among the Earth's air, water, land and life. The first EOS spacecraft, EOS AM-1, is under construction and will be launched in 1998. EOS will greatly expand MTPE's scope, with benefits ranging from improved long-term weather forecasting to a greater understanding of the Earth.

Bldg. 11 roof gets repairs

The Bldg. 11 cafeteria will undergo roof repairs this month that will affect hours of operation during lunch.

The demolition of the existing roof on Bldg. 11 and installation of new lightweight concrete fill material is estimated to take approximately 21 days, beginning Oct. 9 with completion around Oct. 30. Breakfast service will not change during repairs, however, lunch service will be reduced by one hour. Lunch hours will be from 11 a.m. to 1 p.m.

Additionally, the JSC Exchange Store will change its hours of operation during this four-week phase. The store will be open Monday through Friday—9 a.m. to 1 p.m.

Mission control open for viewing

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of the STS-73 mission.

Based on an on-time Thursday launch, employees will be allowed to visit the MCC from 1-5 p.m. Oct. 14 and 11:30 a.m.-2:30 p.m. Oct. 18.

Employees must wear their badges and escort family members through the regular public entrance on the northeast side of Bldg. 30. Children under five will not be permitted. No flash photography or loud talking will be permitted at any time.

Because of the dynamic nature of missions, viewing hours may be changed. For the latest information on the schedule, call the Employee Information Service at x36765.

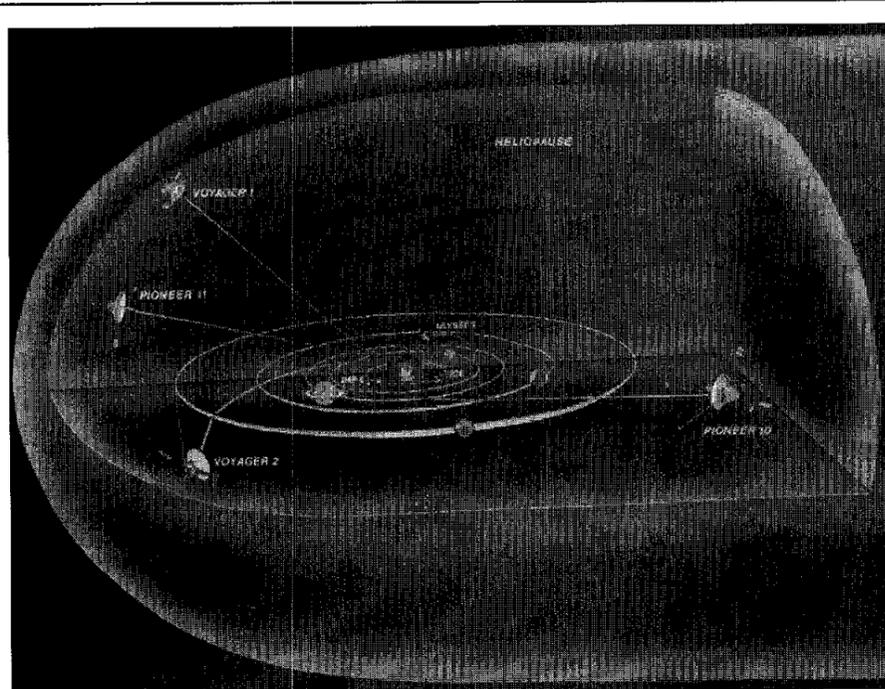
Scientists study Spartan data

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"The White Light Coronagraph instrument obtained spectacularly good data over 95 percent of the planned sequence," Fisher said.

Data from the Spartan 201 Ultraviolet Coronagraph Spectrometer instrument are being examined, and scientists say that preliminary findings show the data are excellent.

Starting in the near future, scientists will begin an in-depth study of the data contained on the tapes from the two Spartan 201 instruments.



In 1990 Pioneer 11 became the fourth spacecraft to journey beyond the solar system, heading in the same direction that the Sun moves through interstellar space. Pioneer 10 is traveling in the opposite direction, and with the two Voyager spacecraft will continue to return information about the Sun's influence deep in space.

Pioneer 11 ends operations

After nearly 22 years of exploration out to the farthest reaches of the solar system, one of the most durable and productive missions in history will come to a close.

Now beyond the orbit of Pluto and more than four billion miles from Earth, NASA's unmanned Pioneer 11 spacecraft is heading out into interstellar space. Because the spacecraft's power is too low to operate its instruments and transmit data, on Sept. 30 NASA ceased daily communications with the spacecraft.

The spacecraft will continue speeding out into interstellar space toward the center of the Milky Way, taking an engraved gold plaque bearing a message about Earth to other civilizations which it may encounter.

"Americans should remember Pioneer 11 as a great achievement," said NASA Administrator Daniel Goldin. "This is the little spacecraft that could, a venerable explorer that has taught us a great deal about the solar system and about our own innate drive to learn. Pioneer 11 is what NASA is all about—exploration beyond the frontier."

"Pioneer 11 has had a spectacular life," said project manager Fred Wirth of Ames Research Center. "It was the second spacecraft to visit Jupiter, roaring through the heart of the planet's huge radiation belts at 107,373 mph, by far the fastest speed ever traveled by a human-made object."

Launched in April 1973, Pioneer 11

reached Jupiter in December 1974. The fly-by was so close—the closest passage ever made past Jupiter—that the spacecraft received heavy bombardment from Jupiter's radiation belts.

In 1979, Pioneer 11 flew within 13,000 miles of Saturn, becoming the first spacecraft to visit that planet. Among its discoveries were two new moonlets and a new ring, and it charted the magnetosphere, magnetic field and the general structure of Saturn's interior. The spacecraft's instruments also measured the heat radiation from Saturn's interior, and found that its planet-sized moon, Titan, was too cold to support life.

Although running out of power, most systems aboard the remarkably durable Pioneer 11 spacecraft are still healthy. For many years the spacecraft has been sending back limited data on the solar wind, magnetic field and cosmic rays, but it can no longer be maneuvered to point its antenna accurately at the Earth. Last week, NASA controllers began using the Deep Space Network antennas to listen for the spacecraft's signal for about two hours every two to four weeks to gather whatever information they can, down from about eight to ten hours per day.

"Some time in late 1996, its transmitter will fall silent altogether, and Pioneer 11 will travel as a ghost ship in our galaxy," Wirth said. "We plan to listen to it once or twice a month to learn about the fade-down process."

Hispanic Heritage Month celebration

The President designated Sept. 15 through Oct. 15 as National Hispanic Heritage Month and JSC is celebrating next week.

The theme for this year's program at JSC is "A Cultural Heritage." This year's celebration is significant for the Hispanic community because it is the silver anniversary for the Federal Hispanic Employment program. President Nixon established the "Spanish Speaking Program" in November of 1970.

In observance, the Equal Opportunity Programs Office, the Houston/Galveston Hispanic Employment Program Manager's Council and the Houston Federal Executive Board are jointly sponsoring a luncheon at 11:30 a.m. Wednesday at the Gilruth Center.

Leonel Castillo, director of the Texas Citizenship Education Project and former commissioner of the Immigration and Naturalization Service, will be the keynote speaker. Castillo will share his views on Proposition 187 and the potential impact on Texas and Hispanic community.

Luncheon tickets are available for \$10 per person. Tickets must be purchased by close of business today. For additional information or to purchase tickets, call Lupita Armendariz or Pat Burke at x30600.

NMA banquet to be held

The Texas Gulf Coast Council of the National Management Association, will sponsor a joint chapter meeting at 5:30 p.m. Oct. 20 at the South Shore Harbour Resort and Conference Center.

Local NMA chapters including the Bay Area Community chapter, Hernandez Engineering, HTI-Link, Johnson Controls, Krug Life Sciences, Lockheed Martin, Loral Space Information Systems, JSC, Rockwell, Grumman, Unisys and the U. S. Postal Service will gather for the presentation of the prestigious Gold Knight of Management Award. Bryan Townsend will discuss "Life is an Adventure."

Tickets cost \$25 per person, and reservations must be made by Wednesday. For more information, call Kyle Brantley at 212-1375, or Rhea Ann Saylor at x32412.

Atlantis to move to launch pad soon

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dock with the Mir Space Station. Atlantis is planned to move to Launch Pad 39A on Columbus Day in preparation.

Endeavour, in KSC's Orbiter Processing Facility-3 shuttle hangar, continues in post-mission servicing following STS-69 last month. *Discovery* is now at Rockwell's Palmdale, Calif., shuttle factory for a nine-month period of modifications, including adding an external airlock in readiness for missions to the International Space Station.

Discovery arrived at Palmdale Sept. 28 atop the 747 carrier jet after an overnight stop in Salt Lake City.

Apollo module on display at Astrodome

(Continued from Page 1)

mand module shape, Parker believed it could be remodified to its original shape and Nowlin agreed that it would suit their needs.

Boiler plates were used during the Apollo program for various tests to check out the preparedness of equipment and procedures. On these vehicles, engineers could conduct parachute and drop tests, and crew training without the risk of damaging the more expensive actual vehicle. Following the Apollo era the boiler plates were adapted as test beds for other materials, hardware and procedures that were proposed for space flight. Boiler plate BP-K was most recently used as a vacuum chamber. The chamber was used for flammability and radiant heat testing in support of general research, technology and shuttle programs. With that task completed, it had been moved to the laydown yard behind Bldg. 423 for storage.

The Office of Public Affairs acquired BP-K in April. When the 18,000 pound piece of NASA history arrived at the exhibits shop, it still had pipe flanges, exterior electric valves, cables

and a square hatch that was used to slide items in and out of the chamber for testing. In addition, the interior was blackened and cluttered with remnants of previously flame tested articles. To recreate the original look of a command module and lighten the unit, it was in serious need of "body work." The arduous task fell to Roger Eklund of Hernandez Engineering at the JSC exhibits shop.

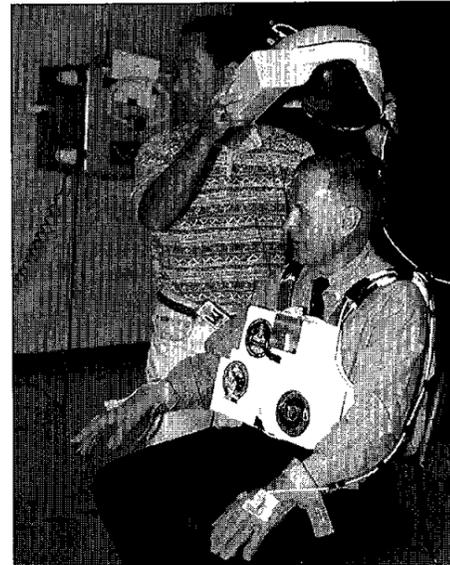
Eklund removed all but one of the exterior pipe flanges, all of the electric valves and cables, and the square hatch. He then welded in place a plate to cover the hole left by the hatch. After smoothing out the seams, a long lasting epoxy paint was applied to preserve the surface. He next created a template from the hatch of the Apollo 17 command module currently on display at Space Center Houston, and used it to paint a simulated hatch on the side of the boiler plate. As a final touch, decals of the American flag and the NASA logo were applied to provide a realistic look to the module.

One of the exterior pipe flanges was left in

place to identify the unit as a boiler plate. The inside was cleaned up and the vehicle is now a hollow shell. In all, approximately 1500 pounds of excess material was removed from the boiler plate vacuum chamber configuration.

An obvious link between NASA and the Astrodome has existed for the 30 years that the domed stadium has existed. It was the Astrodome that NASA chose as the ideal place to hold one of the world's biggest barbecues to welcome the original seven Mercury astronauts to the new "Space City." The Apollo Command Module boiler plate will soon become part of a museum display to pay tribute to the bond between the Astrodome and the surrounding community, including JSC.

Work begins next week on a pedestal which will support the artifact at the Astrodome complex. The module will be affixed at a 36-degree angle on the pedestal located on the grassy burl to the left of the Mirworth entrance to the dome. It will be there on a permanent loan as a symbol of a lasting partnership from one Houston landmark to another.



JSC Photo by Robert Markowitz

FOUR STAR VISIT—General Wayne Downing, commander of the U.S. Special Operations Command at MacDill Air Force Base, checks out the virtual reality in Bldg. 9.